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Amateur Photographer.

TALKS WITH BEGINNERS.

X.—LANTERN SLIDES.



FAIRLY good optical lantern should be included in the outfit of every amateur. However beautiful our prints may look on paper and mounted in albums, they are capable of giving pleasure to only a few at a time; but when reproduced on glass as slides for the lantern and thrown upon the screen, they

afford delight to a room or a hall full of people at one and the same time. Then, too, as every printer knows, much of the delicate detail of a good negative is lost even in the very best prints on paper. On glass, however, all the detail is preserved, while the beauty and charm of the picture are greatly enhanced in the enlarged projection on the screen. If the photographer has the gift of graphic description, he can entertain his friends with word pictures of his camera outings, which will add life and reality to the pictures on the screen.

It does not come within the province of this "Talk" to recommend any special make or form of lantern. There are many good ones to be had at a moderate cost, and the person who would own one will best consult his own interests by putting himself in the hands of a reputable dealer, stating his needs and the amount he is willing to invest in the purchase. Here I am concerned only with the making of slides adapted to projection. Most writers on this subject aver that the making of a really good slide is one of the most difficult of photographic operations. While I would not wish to seem wiser than the elders, I venture the assertion that with suitable negatives and the right kind of lantern-slide plates good slides can be made more easily, surely and with far less of general fussiness than good silver prints, provided the necessary conditions of cleanliness and careful manipulation are observed. Without these there can be no hope of success.

In common with all other photographic printing methods, the first requisite to the production of the perfect slide is a negative perfectly adapted to the process. The class of negatives best adapted for slide making are those in which a moderately full exposure has secured all the detail without reaching the fogging point, and to which proper development has given a shade more of density than would be necessary to give good positives on paper. Care must be taken, however, not to push development so far as to cause harshness in the contrasts. A skilful worker will turn out good slides from thin negatives, but the beginner is advised to select those of moderate density for his first efforts, chiefly for the reason that such negatives allow greater latitude of exposure, and so reduce to a minimum the danger of losing a slide through wrong exposure.

But whether the negatives be thin or of medium density, they must be perfectly sharp. Whatever our friends of the "naturalistic school" may tell us of the artistic reasons for subduing our distances and middle distances by judiciously throwing them out of focus, we must be deaf to them when making negatives to be used for slide making. In these there must be no diffusion of focus; they must be absolutely sharp, or the lantern will project nothing but a general fuzziness, which is not conducive to enjoyment.

Given, then, a moderately dense, well-modelled, sharply-focussed negative, how shall we proceed to make a good slide from it? In the first place, we need a sufficient number of lantern-slide plates. As most of my readers probably know little of the collodion process, and wish to adopt the method which will lead them most quickly and easily to the end in view, I shall speak only of the more modern gelatine dry plate, which I believe to be capable of giving as good results as those obtained by any other process, and with greater ease and certainty.

Of gelatine plates the slowest kind is the best for slide making. There are many good plates for this purpose now in the market, known as "transparency" or "lantern-slide" plates. Any of these will give satisfactory results if intelligently worked. The standard size for lantern slides is $3\frac{1}{4} \times 4$ inches, and if one cared only to make negatives for this one purpose a "quarter-plate" camera fitted with a thoroughly good lens of the rapid rectilinear type would answer every purpose. According to the size of the negatives, one of two methods is adopted in slide making. If the negatives are quarter plate or 4×5 , or if a portion of a larger negative will, as is often the case, give a "picture," the slide is made by contact printing, just as in the making of silver prints. The negative is placed in a deep printing frame, carefully dusted with a soft camel's-hair brush and covered with the transparency plate, the two film sides being in contact. The exposure is made to diffused daylight or to artificial light, the former being very short. I prefer artificial light, because of its greater uniformity. It is well to cover the back of the transparency plate with a sheet of black or orange paper, to prevent reflection. The spring back of the frame having been fastened in place, the frame is held about eighteen inches from a gas-light or kerosene lamp, and an exposure of about ten seconds is given. There is no magic power in the number ten in this instance. It is given merely as the average correct time of exposure under negatives of moderate density. Thin negatives of course require less time and dense ones more; it is a matter for personal experience. A few trial exposures followed by development will soon enable the beginner to "arrive" in this matter of exposure.

The exposure must be sufficiently prolonged to bring out all the detail without a forced development, but it must not be so prolonged as to produce a veiling of the high lights, which should be nearly clear glass. I say "nearly," because I am not such a stickler as many for absolutely clear glass in the lights. I confess to a liking for a little atmosphere in the enlarged image. But one may easily overdo the matter, and it is probably safer for the beginner to follow the time-honored injunction to keep his high lights clear glass—if he can.

The contact method is the simplest, and requires least in the way of apparatus, but its application is limited for the most part to the reproduction of negatives of nearly the same dimensions as those of the orthodox slide. Very few amateurs, however, content themselves long with a small box, and when they wish to make slides from their large negatives they find themselves somewhat at a loss how to proceed. Of course when one is the fortunate possessor of an enlarging and reducing camera the thing is easy enough. But it is not a difficult matter to arrange a simple piece of apparatus which will answer the purpose. The camera may be placed on a long board which has at one end a frame provided with kits for taking different sizes of negatives. The negative may be evenly lighted by pointing the board toward the sky, or by placing a piece of ground or opal glass behind it. The degree of the reduction is determined by the distance of the lens from the negative, the film side of which should face the lens. Focussing is done as usual. After these preliminaries are settled, the space between the negative and the camera is covered with a cloth and the exposure is made. A little experience will give the knowledge of the proper length of time necessary to give the best results.

The next step is the development of the latent image.

Until quite recently, the pyro, oxalate and hydroquinone developers have been the favorites for this work, with a decided preponderance of opinion in favor of the oxalate developer, on account of its cleanliness and the color imparted to the slide. The pyro developer gives a pleasing brownish tone to the slide, and should by no means be overlooked. The following formula combines the merits of simplicity and efficiency:

Pyrogalllic acid.....	2 grains.
Sulphate of soda.....	4 "
Carbonate of potash.....	3 "
Water.....	1 ounce.

Should the shadows develop with too great density, the quantity of pyro should be diminished.

The hydroquinone developer is greatly praised by those who have used it. The following formula is highly recommended:

Sulphate of sodium.....	40 grains.
Hydroquinone.....	15 "
Carbonate of potash.....	15 "
Water.....	1 ounce.

The color produced by this developer is a bluish black.

If an opalescent deposit forms on the slide, it is easily removed after fixing and washing by rubbing the surface with a tuft of absorbent cotton.

The ferrous-oxalate developer has long been a favorite with me for the development of lantern slides. In order to compound the developer two separate saturated solutions of neutral oxalate of potash and sulphate of iron are made. The oxalate solution is made acid by the addition of oxalic acid, and the iron solution with sulphuric acid, using a piece of blue litmus paper to test the condition of the solutions. To start development, I add one dram of the iron solution to one ounce of the oxalate. If the development hangs fire I add more of the iron solution—one dram at a time until the details are well out—being careful never to exceed the proportions of one part of the iron to four parts of the oxalate. If these proportions are exceeded, a yellow precipitate of oxalate of iron is almost certain to form and ruin the slide. After fixing, it is well to immerse the slide in a clearing solution of alum, water and citric acid. Until quite recently these three forms of developers have been the only ones employed. Lately, however, a new developing agent has engaged the attention of advanced workers, nearly all uniting in pronouncing it superior to the older developers. I refer to eikonogen, which I mentioned in my last "Talk."

Eikonogen is an aniline compound, and as a developer is marked by the rapidity of its action, by cleanliness and by the rich blue-black color it imparts to the film. Leading authorities pronounce it the best developer for lantern slides and give the following formula:

Sulphate of soda.....	10 grains.
Carbonate of potash.....	2 "
Eikonogen.....	5 "
Water.....	1 ounce.

From personal trials of this formula, I can recommend it as giving slides full of delicate detail and of great clearness in the high lights.

After the slides are thoroughly washed, they should be gently rubbed with a tuft of absorbent cotton and set away to dry in a place free from dust.

The next step in slide making is matting and covering. For the cover glasses thin, clear glass is used. It is better to use mats of different shapes and sizes to suit the character of the view on the slide. There are several ways of making the mats. The simplest is to have brass forms of various sizes, and to cut the mats from thin black paper with a sharp knife or a print trimmer. The mats are laid down on the films of the slides, the cover glasses put in place and the edges bound firmly together with narrow strips of black, gummed paper.

For labelling and marking slides, the method adopted by the Lantern Slide Interchange is probably as good as any. After the cover glass is put on, the slide is held in its proper position and the subject label is attached to the right-hand side of the cover glass. A small disk of white paper, called the thumb label, is placed on the lower left-hand corner. This insures the slide being placed properly in the lantern.

I have not sought to enter into the refinements of slide making in this "Talk." My only purpose has been to give explicit directions to the beginner without burdening him with details which are not essential to success. If further instructions are desired by any, I shall be happy to give them to those who will write me for them.

W. H. BURBANK.

DR. CHARLES L. MITCHELL, of the Philadelphia Photographic Society, recommends the following formula for the eikonogen developer:

No. 1.—Eikonogen.....	8 grains.
Sulphate of sodium (crystals).....	16 "
Water.....	1 ounce.
No. 2.—Carbonate of sodium (crystals).....	10 grains.
Water.....	1 ounce.

FOR normal developer, take one part each of No. 1 and No. 2 and two parts of water. The best restrainer for the eikonogen developer is said to be one of the metallic bromides, such as bromide of zinc or copper.

TWO new developing agents have recently reached this country from Germany—viz.: pyro-catechine and para-phenylendiamin. I have received samples for experiment, and shall have something to say about them in January. As the present price of the former is \$7.50 an ounce, and of the latter \$1.50 an ounce, they are not likely to come into very general use.